

HOW MINES BUREAU FUNCTIONS

A LEADING INDUSTRIAL HAZARD

TO furnish the people of the United States with their coal, their iron, copper, zinc and lead, their gold and silver, about 1,000,000 people work in various sorts of mines. Some are surface excavations and others run down into the ground for thousands of feet. Mining is counted as the most dangerous of all industrial occupations, and, with the families of the miners, probably about 5,000,000 people depend on the industry for their food and shelter.

It was a little over ten years ago that the speeding up of industry and the demand for greater output made accidents more common in the mining fields. Workers took more chances, to get out more of the ore in a hurry. The coal output per man rose in the United States to the highest figures in the world, at considerable cost to human life.

Finally, a series of accidents in the coal industry, in which about 75 per cent of the miners are employed, drew the attention of the country so forcibly to conditions prevailing that legislation was passed to establish the bureau of mines under the department of the interior, to see what could be done to cut down the risks.

Started thus, the functions of the bureau spread as more calls came to be made on them to utilize the expert knowledge which was concentrated in the department, until now their work covers a wide range. Teaching first aid, mine-rescue work, testing explosives, helping in the design of cars for mining purposes, figuring ways to save gasoline, fixing a method to store helium gas in abandoned mines; these are some of the functions which the bureau of mines is now called on to perform.

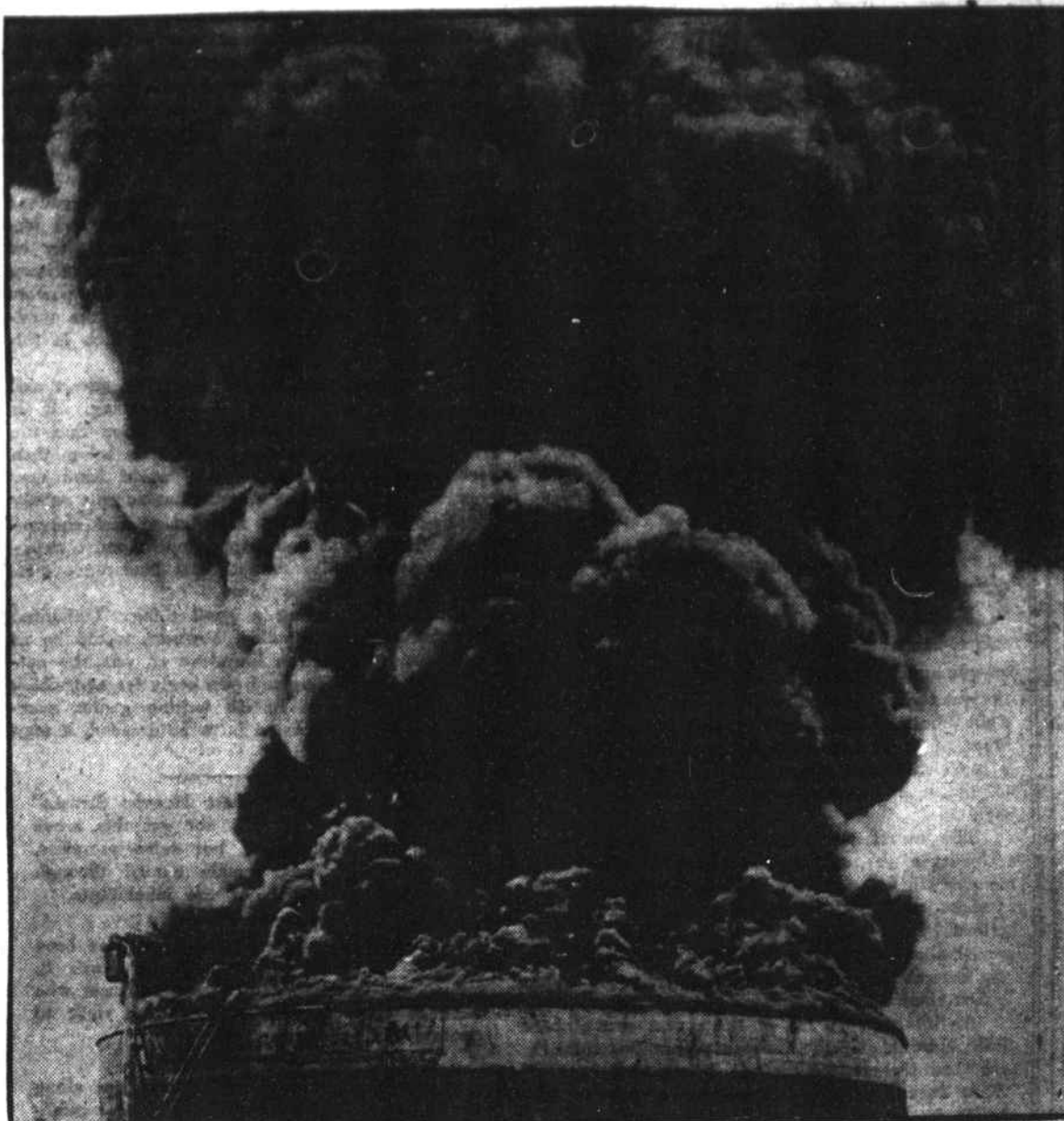
In order to work out some of their theories, the bureau obtained a coal mine, an abandoned one, to be sure, but ideal for their purpose, at Bruceton, Pa., just outside of Pittsburgh. There scientists brought forward their theories and tried them out under practical working conditions, working with deadly coal gases and dangerous explosives, often risking their own lives in an effort to learn how to save those of others who worked under the unusual conditions every day.

THAT these efforts are beginning to have a cumulative effect in the number of lives saved is evident from the fatality records of the coal industry. Although nearly 80,000 more men now are employed than 10 years ago, fatalities are considerably less than when the bureau was started.

The amount of coal mined each year for each life lost has risen 110,000 tons. In 1909, the year before the bureau was started, one life was lost in taking 174,416 tons of coal from the ground. In 1920, the production had risen, for each life lost, to 285,000 tons. At the same time, by making working conditions safer, so that the miner's brain could be devoted to getting out the coal, and not thinking about the accidents, the production of coal per man was increased from 691 tons per man per year in 1909 to 890 tons per man per year in 1918.

In 1907 the figures show that 3,242 men were killed in coal-mine accidents, or 4.76 men for each 1,000 employed. In 1920, with 80,000 men employed, the number of fatal accidents dropped to 2,260.

Another phase of the bureau's labors has been to test out explosives, to determine which kinds are best. The shattering effect of various powders, in various sorts of rock and coal formations have been recorded, to see what sort works best in each case. The gases



BECAUSE someone failed to heed the admonition "be careful," 55,000 barrels of precious oil is going up in a sky-darkening pall, and gas tanks nearby are seriously threatened. After the mischief is started there is little to do but "let her burn" as tank fires are practically inextinguishable.

left from the explosion are tested to see how quickly men can enter the explosion chamber after the blast has been fired without danger of being overcome by poisonous fumes.

Although the quantity of explosives used in coal mines is constantly increasing, fatalities due to explosives are decreasing constantly, and this is a direct contribution to the safety movement. Figures again show that fatalities due to explosives in bituminous coal mines between 1903 and 1910, before the bureau started their work, never ran less than 0.200 per 1,000 men employed. Since 1910 these fatalities have been

cut down to about 0.138 per 1,000, and in 1917 they ran as low as 0.091 per 1,000.

Another most important section of the bureau is that which handles the electrical work. "Juice" is more and more used in mining work, replacing the old style Davy lamp, which was at one time considered the best friend the miner had, because it warned him of the presence of deadly poisonous and explosive gases. Now most mines are lighted by electricity, and most miners carry small electric cap lights, so that fewer open flames are used. This lessens the chances of explosions.

Other lines of investigation cover motors used in hauling the trains of mine cars, the switches which control the electrical machinery used in cutting out the coal, which may flash when turned on and off, and ignite some gas if it is present, the electrical shot-firing equipment, the portable lamps, and storage battery locomotives. Every piece of equipment—that is approved for safety is labeled by the bureau, so that the operator, the inspector and all interested parties can readily recognize such approved equipment.

Many other functions besides making the mines a safer place in which to work are taken up by the bureau. First aid and rescue work is explained, for accidents are bound to happen, even in the best regulated industries, and "What to Do" in the short seconds immediately following a disaster has been known to save many a life which would have been lost had it been necessary for aid to come from any distance.

So well is the work appreciated that last year over 10,000 miners took the first-aid course. Their wives and children are taught also, if they wish to learn, and the story is told of the 16-year-old son of a miner who, returning for work in the tippie where he had been picking slate from the coal, found a three-year old baby who had fallen in a mud puddle. The baby had been practically drowned when the boy came along, but the first-aid lesson he had learned enabled him to save the baby's life.

In addition to these accomplishments the bureau makes tests, and then more tests. All sorts of equipment from mine cars and storage batteries down to the tiny cups used to set off the heavy blasting charges are tested. Coal dust, zinc dust and sulphur dust from different mines are analyzed and tried out from a danger standpoint.

When an accident from one of these happens in a

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HELPING MINERS SAVE OWN LIVES



"SAFETY FIRST" far underground. This blazing admonition at the entrance to the main level of a great coal mine cannot be forgotten by car drivers and machine and shovelmen. It is part of a movement which has resulted in the saving of hundreds of lives and property worth millions.